

Roberts (J.B.)

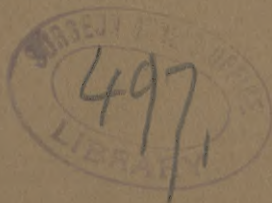
al

SIMPLICITY IN THE TREATMENT OF FRACTURES.

BY JOHN B. ROBERTS, A. M., M. D.,
PHILADELPHIA.

*Reprinted from the Transactions of the Medical Society of the State
of Pennsylvania. 1893.*

presented by the author -



SIMPLICITY IN THE TREATMENT OF FRACTURES.

By JOHN B. ROBERTS, A.M., M. D.,

PHILADELPHIA.

The essential factors in the treatment of broken bones are, undoubtedly, the early replacement of fragments, the prevention of recurrence of displacement, attention to the condition of the soft parts and due consideration of the patient's general health. After the reduction has been satisfactorily accomplished, displacement may occur through the action of gravity, muscular, contraction or restlessness of the patient; and the surgeon must guard against such recurrence by applying some form of fracture dressing which retains the fragments in proper position. The best form of dressing will, as a rule, be that which corrects the tendency to displacement and at the same time steadies and immobilizes the limb. Special tendency to displacement varies with the line and position of the fracture, and should be recognized by the surgeon before he decides upon a form of dressing.

Fracture dressings may be classed under three divisions:—First, those which give moderate continuous traction or maintain the extension which was applied when the fracture was first adjusted; second, those which by virtue of their rigidity or fixedness resist retraction; and finally, those which, by virtue of their inflexibility, prevent angular or lateral displacement by furnishing lateral support to the fracture.

These statements, which are almost axiomatic, will probably meet the approval of all the members of the society; but it is more than likely that in a general discussion of the subject there would be advocated a dozen different ways of treating the same fracture. It seems to me that surgeons often lose sight of the fact that simplicity in fracture dressings is as much a surgical virtue as simplicity in the form of instruments used in surgical operations.



Simplicity in the treatment of fractures is often neglected because of an obsequious reverence for the names of former surgical teachers, which have become attached to a splint or method of dressing. It is stated that legends and traditions, connected with historical places, never die; it is, unfortunately, true that surgical traditions have a similar lasting and often deleterious influence upon the progress of surgery. Illustrations of this are seen in the present use of Bond's splint for fracture of the lower end of the radius, an appliance founded upon an erroneous understanding of the nature of the injury, and one of the worst splints which can be used in its treatment. Physick's long splint for fracture of the femur is still used in this injury by many surgeons, who fail to realize that a more modern method of dressing is less troublesome to the attendant and more comfortable and safe for the patient. Desault's dressing for fracture of the clavicle has now no value except as a puzzle with which to entangle unhappy students under examination; yet it is probably still employed.

Many books are filled with elaborate descriptions of fracture dressings, whose number seems to be limited only by the patience of the author. Hamilton's *Treatise on Fractures* is so full of these complicated splints and devices that the young practitioner is hopelessly lost in selecting a method for treating a fracture under his immediate care. Individuals, as well as races, are born with mental characteristics which drive them to invent and advocate complicated methods in all the pursuits of life. The English and German surgeons perhaps illustrate this tendency to an extreme degree. Some American surgeons, partly from individual traits and partly from over developed imitative faculties, are led in the same direction.

A truly wonderful illustration of this perversion of the mind is found in Bardenheuer's *Guide to the Treatment of Fractures*. I show a single illustration taken from his book in proof of my statement. Could anything be more preposterous than the method by which a patient with an ordinary fracture of the lower end of the radius is here treated. He is shown confined in bed, with weights and pulleys attached to his arm and hand so as to make traction in five different directions.

Such a method of dealing with an injury, which ordinarily needs scarcely any splint, is a travesty of modern surgery. That even an American can accept such complicated dressings

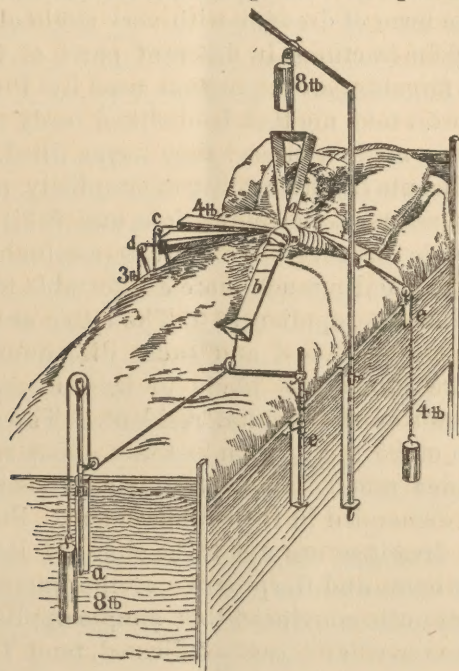


FIG. 1.

is shown by a visit to the wards of some of our large metropolitan hospitals. I recently saw in a hospital in a neighboring city a patient with fracture of the thigh. The dressing was a Physick's long splint, combined with the extension apparatus of Buck and I think a plaster of Paris encasement;—that is this afflicted patient had about as much apparatus applied for his single fracture as would be required for the treatment of three patients with a similar injury. Any one of the appliances would be sufficient for an ordinary fracture of the femur.

Physicians coming to Philadelphia are, I think, often surprised at the simplicity of the dressings used in some of our hospitals. It is certainly gratifying to know that we do work in a less complicated manner than is the case in some other cities.

Another reason for a want of simplicity in fracture dressing is that students are often taught during their pupillage that each fracture has its special splint; hence they do not realize that the same form of dressing with very slight alteration will often answer for fractures in different parts of the body. I have never forgotten an expression used by Prof. Chiene of Edinburgh, who told me that he disliked ready made splints as he did ready made trousers; they never fitted.

Few will dispute the desirability of simplicity, provided that simple measures meet the indications and fulfil the surgical objects. Simple dressings are always attainable, they are cheap, and are usually much more comfortable to the patient than more elaborate appliances. The latter are much more liable to become displaced and cause discomfort, and their intricacies are much less likely to be understood by the patient's friends or the hospital resident. The complication also tends to make the surgeon hesitate about removing the dressings, since much time, considerable assistance and no little skill is demanded in their replacement. For this reason complicated dressings are apt to be changed less frequently than simpler ones, and the progress of the fracture less often noted. I am quite convinced that simple appliances, which are readily removed and easily adjusted, tend to give better results, because of the more frequent examination and inspection given the injured limb.

I would obtain simplicity by disregarding all the unnecessary portions of dressings, and by selecting simple articles for retaining the fragments in apposition. The primary bandage, often applied to the limb before the splint is adjusted, is unnecessary and sometimes harmful; it is seldom used by practical surgeons of to-day. Embrocations of lead water and laudanum, and of similar drugs, supposed to lessen the amount of inflammation at the seat of fracture should be discarded, as they have no potent influence in lessening the inflammatory exudate, and may perhaps by maceration of the skin lead to blebs on the surface of the limb. Proper coaptation and freedom from muscular contraction are the factors most needed in the treatment of the inflammatory condition. With omission of the primary bandage and the embrocations, which some

surgeons cling to as a sort of fetich, there is nothing to be applied to the fracture but the retentive apparatus. This should be of the simplest description. The surgeon who has sufficient individuality to refuse to pay for a carved or moulded splint of metal offered by an instrument maker, will seldom have difficulty in dressing a fracture in a simple manner.

The form of displacement and the character and seat of the fracture will give a hint to an observant surgeon as to the kind of apparatus to be used. Any form that tends to maintain the proper contour of the bone after reduction is the one needed. If wooden splints are used, they should be very light and seldom thicker than the lid of an ordinary cigar box. Heavy splints with much padding are uncomfortable to the patient because of their weight and heat. In most fractures comparatively little strain is likely to be thrown upon the broken bone during treatment; hence a splint with a moderate degree of rigidity is all that is needed to prevent displacement.

There is no question that the best splints in use are those which are moulded to the limb after reduction of the fracture. These fit any inequality of the surface without padding, and therefore can be very light and worn with comfort. Moulded splints are most readily made from butter cloth or cheese cloth dipped in plaster of Paris, paste, or glue. They are readily prepared and can be moulded to the form of the limb without giving the patient pain. In some cases almost no apparatus is needed because the parts may be put in the position which places the displacing muscles at rest and which ensures proper coaptation of the fragments; for example, a fracture of the fibula, in which there is very little tendency to displacement, may be treated by simple bandaging, or even this may be dispensed with, because the parallel tibia makes an efficient splint. In some fractures of the phalanges an adjoining finger or toe acts as a good splint or the finger of a glove made rigid will keep the parts in good position. A little additional firmness can be given to the glove finger by painting it with glue or mucilage. In the same way a stocking may be used as a splint by mak-

ing it a little more rigid with starch, plaster of Paris or other hardening material.

The rapidity with which plaster of Paris mixed with water solidifies, makes it, by all odds, the best material for moulded splints. Felt or guttapercha may be softened by dipping it in hot water and then moulded to the part; but these materials

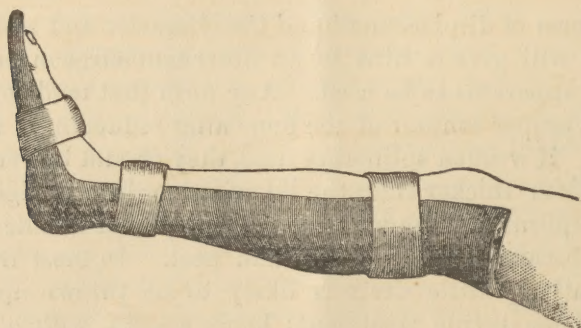


FIG. 2.

Splint made of layers of gauze stiffened with plaster of Paris. (From Stimson.)

are not so easily obtained as gypsum or plaster of Paris, which is always to be found in any country store. Strips of gauze or other woven fabric may be converted into excellent splints by saturating them with plaster of Paris and water. Eight or ten of these strips applied to a limb soon become hard and hold the fragments in position. Lateral, anterior, or posterior splints of any shape may thus be made and are to be held in place by a roller bandage. The plaster of Paris must be kept dry, for if it has absorbed moisture it will not set. The setting may be retarded by adding a little dissolved glue or borax or cream of tartar, or by the use of cold water in making the mixture. Setting may be hastened by the use of hot water or by adding a little common salt to the water. It takes very little skill to cut V-shaped pieces out of the gauze and to overlap the edges when the corners are to be turned; a moderately good surgeon can make a splint of this kind fit perfectly. In compound, or open fractures, openings can be left or made in such splints. Strips of metal to further stiffen the splint or metal rings for supporting a limb may be incorporated in the layers of gauze and gypsum.

Sometimes we can use another part of the body to maintain apposition of the fragments. Thus in fractures of the upper part of the humerus the thorax is used as a splint when the arm is bound by a bandage to the chest. Fractures of the lower jaw are usually treated by using the upper jaw as a splint.

In the treatment of open, or compound, fractures, less simplicity is possible in the first dressing; but the surgeon who is

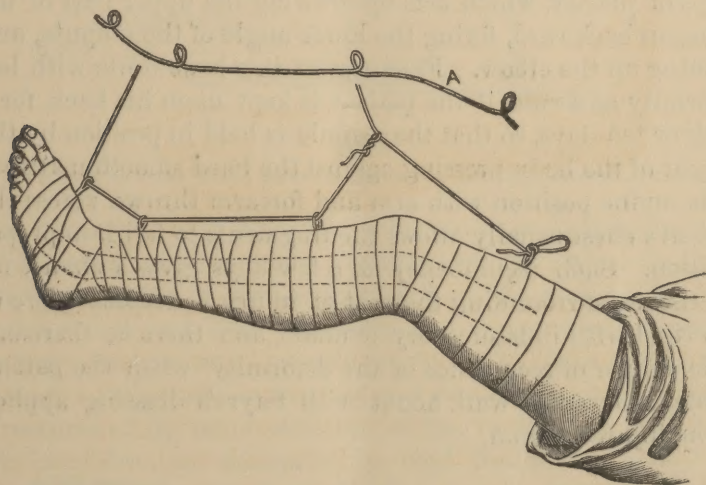


FIG. 3.

Leg dressed with anterior and posterior moulded splints, with rings for suspension incorporated in the layers of gauze. Splints are indicated by dotted lines on the bandage. A. shows form of wire in which rings are made. (From Stimson.)

fully imbued with the doctrines of antiseptic surgery will usually be able to convert fractures of this kind into what are practically closed ones. Thoroughly laying open the injured regions, scraping out all particles of dirt, scrubbing the parts well with soap and water and a nail brush, and providing for removal or asepticity of all accumulations of blood will enable him to put a dry antiseptic dressing and a splint upon the injured extremity, with the conviction that the wound will probably go on to recovery with very little variation from the clinical course in uncomplicated fractures in the same region.

It perhaps will aid in the discussion of this subject if I give illustrations of simple methods of treating common fractures.

It will be understood, of course, that my personal preferences are shown by these illustrations; but naturally there are many other equally simple methods of treating the same injuries, which may be adopted by other surgeons. Necessarily these descriptions refer to such fractures of bones as are ordinarily seen, and not to cases of unusual severity.

Fractures of the clavicle are usually satisfactorily treated by Sayre's adhesive plaster dressing, consisting of two long strips of plaster, which acts by drawing the upper part of the humerus backward, fixing the lower angle of the scapula, and pushing up the elbow. Fractures of this bone unite with less deformity as a rule, if the patient is kept upon his back for a week or ten days, so that the scapula is held in position by the weight of the body pressing against the hard smooth mattress. This supine position with arm and forearm thrown across the patient's chest usually allows the fragments to fall into proper position. Such recumbency for a few days gives a chance for the tissues surrounding the seat of injury to become more or less rigid with inflammatory exudate, and there is, therefore, little danger of recurrence of the deformity, when the patient is later allowed to walk about with Sayre's dressing applied to the injured region.



FIG. 4.

Anterior splint with axes of the two portions such as will preserve the carrying function in fractures of humerus at elbow.

Fractures of the upper end of the humerus are successfully treated by putting a single towel in the axilla and then bandaging the upper arm to the side of the chest, having the forearm, which is otherwise free, carried in a sling.

Fractures of the middle of the shaft of the humerus are well managed by an internal angular splint, preferably made of gauze and plaster of Paris. Fractures of the lower end of the humerus are best treated with the elbow in the extended position so as to retain the carrying function of the arm. I prefer holding it in this position by a splint of wood having the

obliquity of the normal axes of the arm and forearm or by means of a gypsum splint.

Fractures of the forearm require an anterior and posterior straight splint, which should be neither too wide nor too narrow. Fractures of the lower end of the radius usually require nothing but a wristlet or band of adhesive plaster carried around the lower end of the bone to restrict the movements of

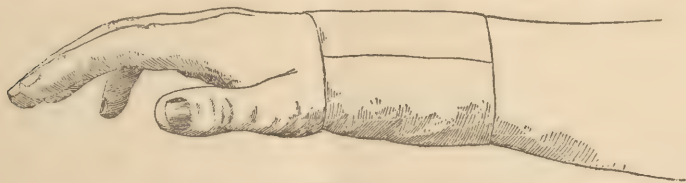


FIG. 5.

Fracture of lower end of radius dressed with a wristlet of adhesive plaster.

the wrist joint after reduction. Where there is unusual comminution of the fragments, a straight wooden splint about six inches long and an inch wide placed on the back of the wrist is all that is required. Fracture of the olecranon demands scarcely more than a wooden splint about eight inches long and one inch wide in front of the elbow to prevent flexion. Fractures of the femur whether of the neck or shaft or above the condyles can generally be well treated by permanent traction made by attached adhesive plaster and a weight fastened to a rope going over a pulley at the foot of the bed. By altering the direction of the traction, the surgeon will find this method satisfactory in all ordinary cases. Sand bags at the sides of the femur to prevent displacement or a short splint of binder's board around the thigh at the seat of fracture is the only additional apparatus likely to be needed. Sometimes this can be omitted. For fractures of the tibia and fibula a fracture box, or plaster of Paris splint meets all the ordinary indications.

